

## PATENT CLAIMS:

1. Method for controlling a device for the ablation of parts of the human eye by means of laser irradiation, the control being exercised by an electronic data-processing system, characterized in that, once the optical and geometric eye data have been established, a graphic simulation of the ablation is carried out in the form of a graphic visualization.
2. Method according to the previous claim, characterized in that the input of all the treatment parameters to be entered manually is carried out by means of a central input/output device.
3. Method according to the previous claim, characterized in that the establishment of the operating parameters comprises one or more of the following process steps
  - 3.1 establishment of topography data of the eye,
  - 3.2 establishment of subjective and/or objective refraction data of the eye,
  - 3.3 establishment of higher-order aberration data by wave-front measurement,
  - 3.4 establishment of pachymetry data;
  - 3.5 establishment of pupillometry data,
  - 3.6 point-accurate overlaying of all the measurement data from 3.1 to 3.5 in a fixed coordinates system of the eye
  - 3.7 calculation of height data of the deviations relative to a reference surface,
  - 3.8 calculation of a height data difference relative to the reference surface,
  - 3.9 calculation of an adapted height data difference relative to the reference surface,
  - 3.10 calculation of ablation coordinates for the laser.
4. Method according to one of the previous claims, characterized in that, in a further intermediate step, height data of the deviations of the cornea surface relative to a reference surface are calculated from the topography and/or refraction data.

5. Method according to one of the previous claims, characterized in that, in a further intermediate step, the tissue to be abraded from the cornea is determined from the height data of the deviations of the cornea surface.
6. Method according to one of the previous claims, characterized in that the topography data result in K values and/or a curvature map and/or a topography map and/or a power map which can be used to control the device for ablation.
7. Method according to one of the previous claims, characterized in that the spherical and/or cylindrical refraction are included in the data for controlling the ablation device.
8. Method according to one of the previous claims, characterized in that the reference surface of the topography data is an ellipsoid.
9. Method according to one of the previous claims, characterized in that the reference surface of the refraction data is a spheroid.
10. Method according to one of the previous claims, characterized in that the device for ablation includes a laser and/or means for wave-front measurement.
11. Device for treating the human eye by means of laser irradiation comprising an apparatus for measuring aberrometry, an apparatus for measuring topography, an apparatus for measuring pachymetry, optionally an apparatus for measuring pupillometry, an apparatus for point-accurate, centred overlaying of the measurement data of all measuring apparatuses, a laser unit and an electronic data-processing apparatus, which by using a processing model can link the measurement values and other patient data to ablation values.
12. Device according to one of the previous claims, characterized in that it includes a measuring equipment arrangement which allows measurement of aberrometry, topography, pupillometry and also pachymetry by means of a fixing.

13. Device according to the previous claim, characterized in that the ablation can be displayed graphically as an ablation map.